

SIPHONAPTERA COLLECTED BY HAROLD STEVENS ON THE
KELLEY-ROOSEVELT EXPEDITION IN YUNNAN AND
SZECHUAN.

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(With 17 text-figures.)

THE collection is an important contribution to our knowledge of the fleas of China. Twelve species were obtained, one of them represented by 2 subspecies; of these 13 different forms no fewer than 10 are new, and the remaining 3 are represented by specimens among which there is the hitherto unknown sex. Two of the species are so different from everything hitherto discovered that new genera have to be proposed for their reception. We draw special attention to species No. 13, a most striking insect. We thank Mr. H. Stevens very sincerely for making this fine collection and Dr. W. H. Osgood for placing it at our disposal and giving me the names of the hosts.

Mr. Stevens travelled via Burma to Yunnan, and then joined the Kelley-Roosevelt Expedition in West China.

1. *Ceratophyllus sinicus* sp. nov. (text-fig. 33).

♀. Near *C. rossittensis* Dampf 1912, but apex of bursa copulatrix sclerified, and the sclerified portion of the duct of the spermatheca much longer, being nearly as long as in *C. vagabunda* Boh. 1865; differs from the latter species in the short stylet, the much less extended sclerification of the bursa copulatrix, the incurved abdominal sternite VII, the smaller number of bristles on the inner surface of the hindcoxa, etc.

Anterior row on frons with 4 or 5 bristles, the middle one smaller than in *C. rossittensis*; bristles on occiput 1 or 2, 2 and 6, above antennal groove about 16 small ones inclusive of those at posterior angle, which are longer. Genal process ventrally less rounded than in *C. rossittensis*. Antennal segment II with 6 long bristles at apical margin, i.e. fewer than in the allied species.

Pronotum with a comb of 28 spines and a row of 14 long bristles. On meso- and metanotum a row of 11 or 12 and in front of the row about 22 small bristles, somewhat irregularly placed, 8 false spines on mesonotum; on mesopleura 5 or 6 long bristles and anteriorly about 6 small ones; on metepimerum 2, 3, 1 on one side, 3, 3, 1 on the other.

Stigma-cavity of abdominal tergites III to VII round, that of VIII more prolonged upwards than in *C. rossittensis* and *C. vagabunda*; number of bristles on tergites (the two sides together): I 30, 10, II 24, 12, III 20, 14, VI 23, 14, VII 25, 13; on sternites: III 4, 6, IV 2, 6, V 2, 8, VI 3, 8, VII 10, 9; on VIII. t. above stigma (on each side) 10 or 11, below stigma 3 or 4, of which 2 or 3 are long, on lower surface 12 on one side, 15 on the other, inclusive of apical marginal ones, on inner side 4 subapical short ones. Stylet less than twice as long as broad.

On inside of hindcoxa in apical half a submarginal row of 3 bristles on left coxa and 5 on right one, no submarginal bristles on inside farther dorsad. On outside of midfemur 1 subapical subventral bristle, above it 1 or 2 lateral ones, on inside 1 subventral near apex, 2 lateral ones in anterior half, and 1 ventral

towards subbasal notch; on outside of hindfemur 1 subventral subapical bristle, no lateral ones, on inside 4 or 5 lateral ones, besides the subapical one and the subbasal one (not counting the pair in the subbasal notch); on outside of hindtibia 11 or 12 subdorsal lateral bristles exclusive of apical one.

VII. st. much less evenly rounded than in the allied species, its apical margin oblique and somewhat incurved in ventral half, upper half strongly rounded and projecting beyond lower half. Sclerified portion of duct of spermatheca as long as bursa copulatrix plus its duct; only a small apical portion of the bursa sclerified.

IX. t. at and near angle below stylet with 2 or 3 bristles, no marginal bristles farther frontad. Spermatheca as in *C. vagabunda*, very slightly narrowing towards orifice.

Length: 3.3 mm. (somewhat expanded), hindfemur: 0.47 mm.

Szechuan: Wu-chi, May, on *Ochotona cansa*, 1 ♀.

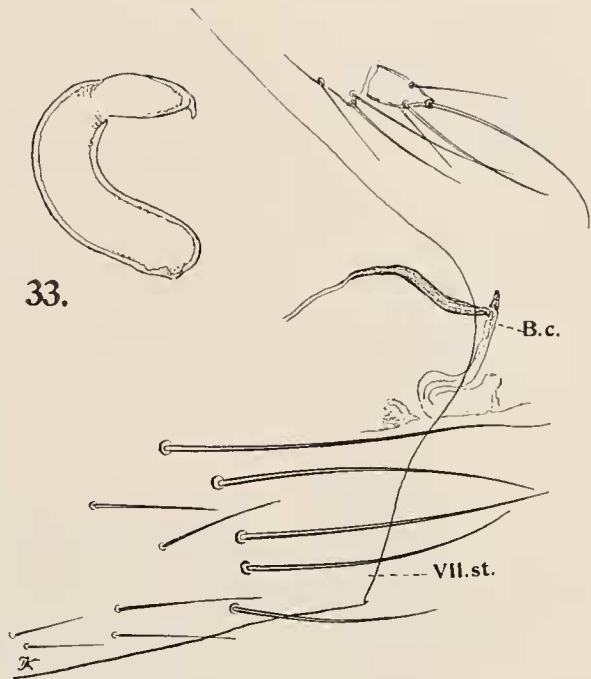


FIG. 33.—*Ceratophyllus sinicus* ♀.

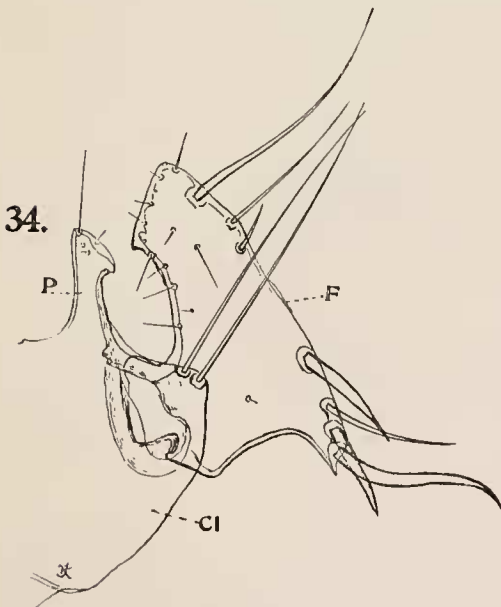


FIG. 34.—*Ceratophyllus euteles* ♂.

2. *Ceratophyllus euteles* J. & R. 1911 (text-fig. 34).

Yunnan: Yun-ning, 21. and 24.iii., on *Dremomys pernyi griselda*, 2 ♂♂, 3 ♀♀.—Szechuan: Mi-hola, 10,000 feet, 25.iii., on *Dremomys pernyi griselda*, 2 ♀♀; Muli, 30.iii. and 6.iv., on *Callosciurus erythraeus gloveri*, 2 ♂♂, 1 ♀; Wu-chi, 16.v., on *Ochotona cansa*, 1 ♂; Yulong-kong, 4.vii., on *Dremomys pernyi griselda*, 3 ♀♀; Omi-shan to Liang-fing-kang, 8.x., on *Tamiops swinhoei*, 1 ♀.

Described by us from 3 ♀♀ obtained by M. P. Anderson 23 miles S.-E. of Ta-tsien-lu on *Sciurotamias davidianus consobrinus*. The species is close to *C. fimbriatus* J. & R. 1921 from the Western Himalayas, the two possibly being geographical representatives of one species. The ♂ of *C. euteles* differs in the elasper being more rounded on the distal side, the acetabular bristles not being placed on a projection, in process P being shorter, the base of F narrower and the apex broader, the stout upper one of the ventral spiniforms of F farther dorsal than in *C. fimbriatus* and stouter, and the long ventral spiniform much longer and first incurved and then excurved. In the ♀ the abdominal sternite VII has the apical margin either slightly incurved or slanting.

3. *Frontopsylla spadix cansa* subsp. nov. (text-figs. 35, 36).

♂♀. Very close to the following subspecies; in ♂ exopodite F apically about one-sixth or one-seventh wider, large apical spiniform longer; in ♀ sinus

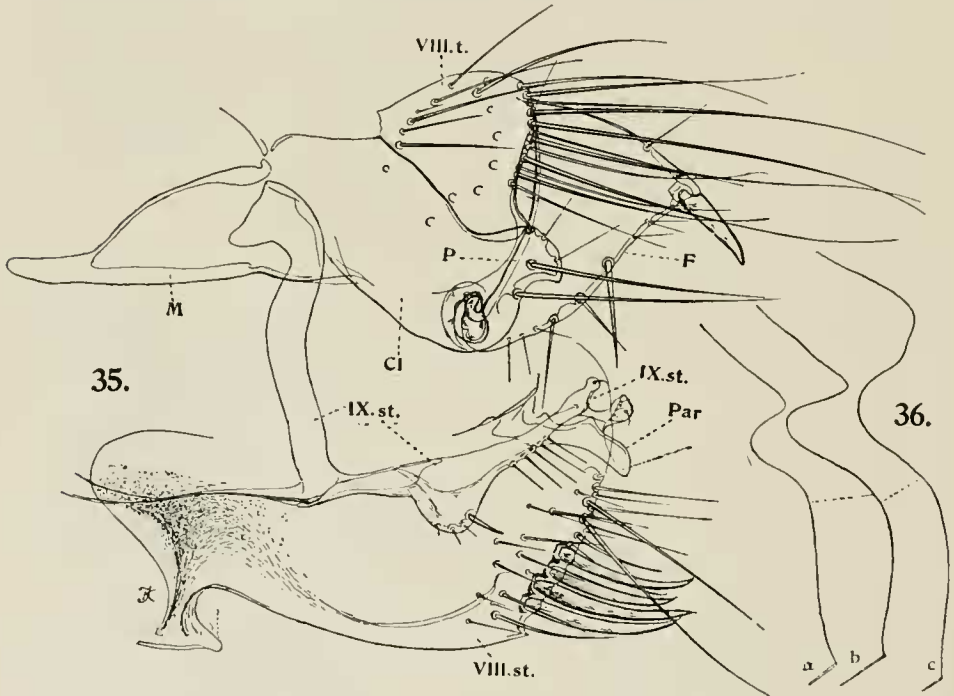


FIG. 35.—*Frontopsylla spadix cansa* ♂.

FIG. 36.—*Frontopsylla spadix cansa* ♀.

of VII. st. deeper, the lobe above it therefore longer, in the 2 specimens from Wu-chi much narrower than in the one from Ku-lu (text-fig. 36 a and b from Wu-chi, c from Ku-lu).

Szechuan: Ku-lu, 25.iv., on *Ochotona thibetana*, 3 ♂♂, 1 ♀; Wu-chi, 13. and 16.v., on *Ochotona cansa*, 3 ♂♂, 2 ♀♀.

4. *Frontopsylla spadix spadix* J. & R. 1921.

Yunna: Nguluko, 20.ii., on *Apodemus silvaticus latorum*, 1 ♂.—Described from a single ♀ obtained in Upper Burma. The ♂ is like *F. sp. cansa* except for the small differences mentioned under the preceding subspecies.

5. *Paradoxopsyllus custodis* sp. nov. (text-figs. 37, 38).

♂♀. Near *P. curvispinus* Miyajama 1909, but bristles of hindtarsus prolonged neither in ♀ nor in ♂; hindtibia with 9 dorsal notches, of which the third, sixth and seventh bear one bristle. In ♂ VIII. t. without lateral patch of long bristles, F of even width, strongly curved at base, apical lobe of ventral arm of IX. st. round at apex, irregularly long-ovate, etc. In ♀ VII. st. with small, but distinct, sinus.

Frons with 3 eye-bristles, in ♂ an additional, moderately long one, at antennal groove behind the anterior row, this row consists in ♂ of 6 bristles, in ♀ of 2; on occiput 1, 2, 5, all rather slender with the exception of the ventral one of the posterior row, below this long bristle an additional short one. Chaeto-

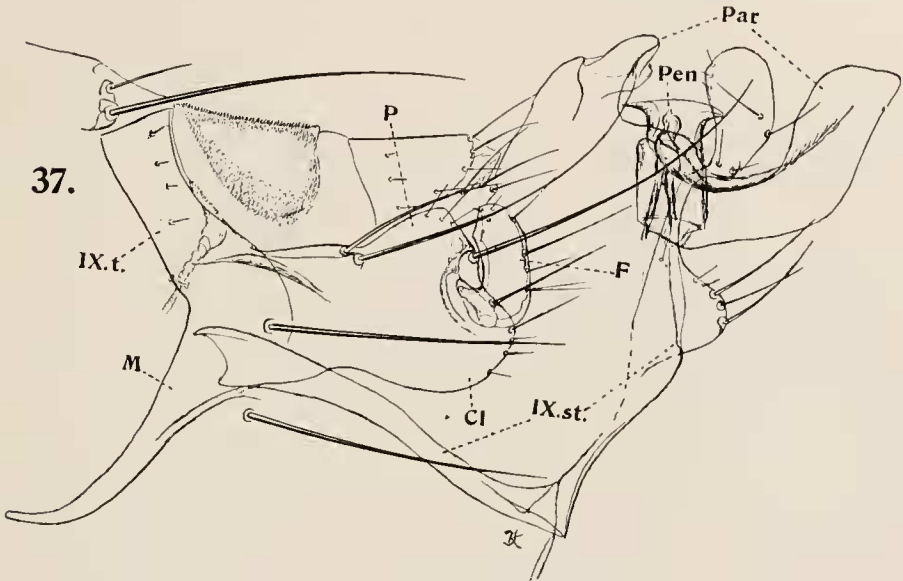


FIG. 37.—*Paradoxopsyllus custodis* ♂.

taxy of thoracic and abdominal tergites nearly as in *P. curvispinus*; in ♂ abdominal tergites I to IV with an apical spine on each side. Bristles on abdominal sternites (the two sides together): in ♂ III 5 or 7, IV 6, V 5, VI 5 or 4, VII 3 or 6, VIII 4 or 5; in ♀ III 13, IV 10, V 6, VI 7, VII 8.

On inside of hindcoxa a submarginal row of 4 to 6 bristles. On hindfemur 1 subapical ventral bristle on both out- and inside (occasionally 2 on outside), and a subbasal lateral bristle on inside. Hindtibia with a subdorso-lateral row of 7 or 8 bristles on outside; longest postmedian dorsal bristle reaching to or a little beyond apex of tibia, longest dorsal apical one extending somewhat beyond subapical notch of tarsal segment I, but not to apex of I, longest of segment I to subapical notch of II, longest of II to apex of III or a very little beyond; at anterior side of segment I 4 or 5 notches bearing bristles, on posterior side 6 (inclusive of apical notch). Measurements: midtarsus, in ♂ 16, 14, 9 or 10, 7 or 7½, 14 or 15, in ♀ 18, 14, 10, 7, 14; hindtarsus, in ♂ 32 or 33, 21, 12, 7 or 7½, 15 or 16, in ♀ 35, 21, 12, 7½, 15.

Modified Segments.—♂. On VIII. t. above stigma 3 or 4 small bristles, below stigma 2 very long ones. Clasper more than twice as long as broad at the narrowest point, distally strongly rounded ventrally, and dorsally enlarged into a stout broad process P, which is obtusely triangular, about twice as broad at the base as high; angle between manubrium M and inner portion of IX. t. very obtuse; M slender; upper acetabular bristle very long and placed well above the acetabulum, lower one very much smaller, about the size of the subdorsal bristles. Exopodite F nearly even in width, two and one-half times as long (measured in a straight line) as broad, base strongly curved, apex very obliquely truncate on frontal side; at posterior margin 4 bristles, not quite equidistant, the third the longest, about the size of the second acetabular. Vertical arm

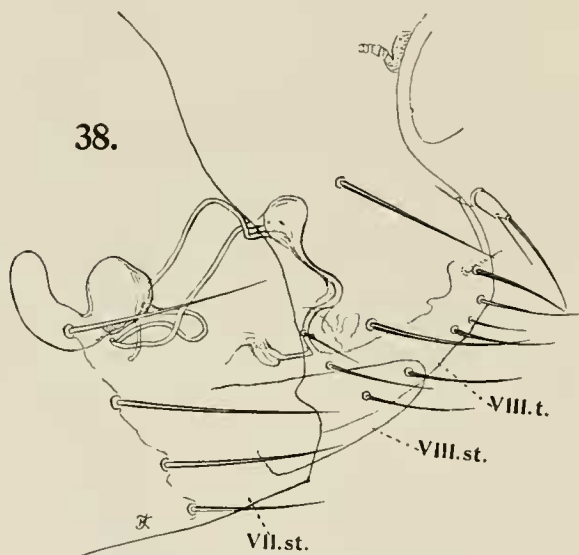


FIG. 38.—*Paradoxopsyllus custodis* ♀.

of IX. st. narrow, apex strongly excised, with the posterior angle much more strongly projecting than the anterior; median lobe of ventral arm broad, rounded, bearing, besides a few small hairs, three long bristles, of which the median one is smallest, these bristles much shorter than in *P. curvispinus*; apical lobe nearly twice as long as broad, irregularly ovate, apically evenly rounded. Armature of penis large, the end-portion consisting of a large ventral flap, curved up, slightly broadening towards apex, apically strongly rounded dorsally, whereas the ventral apical angle is distinct, but rounded off at tip; this flap connected with the dorsal armature, consisting chiefly of a finger-like process which projects from the dorsal enveloping sheath. End of ejaculatory duct surrounded by sclerites which form a sort of anvil.—♀. VII. st. with a small sinus below middle of apical margin; VIII. t. with 2 or 3 bristles above stigma, 1 long and 1 small below stigma, 8 or 9 on lower area, and 2 or 3 inside, of which 1 is marginal. Duct of bursa copulatrix strongly curved in middle, bursa rather large; head of spermatheca subglobular, slightly depressed posteriorly on upperside, much shorter than the tail.

Length: ♂ 2 to 2.1 mm., ♀ 2.5 mm.; hindfemur: ♂ 0.38 mm., ♀ 0.40 mm.

Szechuan: Mu-li, 31.iii., and Wu-chi, 15.v., on *Antelionmys custos*, 2 ♂♂, 1 ♀.

Geusibia gen. nov.

♂♀. Near *Ctenophyllus* Wagner 1927, but tibia and tarsal segment I of all legs densely hirsute with minute hairs on the dorsal margin besides bearing long

bristles; segment I of midtarsus one-half longer than II; no antepygidial bristles in ♂, 3 in ♀, VII. t. with median process which is short in ♀, and long in ♂, here reaching a little beyond middle of pygidium; orifice of spermatheca on a prominent cone projecting downwards.

Frontal tubercle prominent, as in *Frontopsylla* Wagner & Joff 1926. Three eye-bristles which are placed in ♂ far in front of the internal genal loop, the ventral one close behind base of maxillary palpus. Proboscis reaching to near $\frac{2}{3}$ of forecoxa in ♂, to $\frac{5}{6}$ in ♀. Both VIII. t. and VIII. st. of ♂ large, the former conical, without a row of marginal bristles, VIII. t. dorso-laterally with an elongate, horizontal, sclerite bearing a condylus (Co), and evidently connecting VIII. t. with the inner surface of VII. t. (text-fig. 39). Process P of clasper as long as F, broad, conical. Apex of verteal arm of IX. st. broad, truncate-emarginate, with the upper and the frontal angles well projecting. VIII. st. on each side with two rod-like incassations, which unite a basal third of segment, the lower one commencing at ventral frontal angle, the other about at $\frac{3}{4}$ of anterior margin. Hindecoxa (♂♀) slender, one-half longer than broad, in apical half of inner surface small hairs; hindtibia with 8 dorsal notches, the third and sixth bearing a single stout bristle; first pair of plantar bristles of tarsal segment V distinctly bent medially, as in allied genera.—Genotype: *Geusibia torosa* sp. nov.

6. *Geusibia torosa* sp. nov. (text-figs. 39, 40).

♂♀. On frons an anterior row of 5 or 6 bristles, which are the same in size as the dorsal bristles of the subapical row of the occiput, and a row of 3 large eye-bristles, no additional bristles, but a few small hairs. Occiput with 3 rows.

On pronotum a comb of 20 to 22 spines, usually 21, dorsal and lateral spines shorter than pronotum; a row of 11 or 12 bristles. Meso- and metanotum with two rows and additional small bristles; on mesopleura 10 to 12 long or longish bristles and at and near upper anterior angle about 9 to 15 small ones. Metepimerium in ♂ on one side with 7 bristles (3, 3, 1), on the other with 10 (3, 2, 4, 1), in ♀ varying from 6 to 9 (2, 3, 1—3, 2, 1—5, 3, 1—4, 4, 1). Mesonotum with one short stout apical spine on each side.

Abdominal tergite I with 3 rows and some additional dorsal bristles, the other tergites with 2 rows: in ♂ II (on the two sides together) 20, 16, III 16, 15, IV 15, 16, VII 8, 12; in ♀: II 19 to 27, 13 to 16, III 16 to 22, 13 to 16, IV 12 to 17, 11 to 14, VII 3 to 9, 7 to 9. Tergites I to IV with one apical spine on each side, sometimes the spine missing on one side of IV. Sternite II in ♂ with 1 or 2 minute lateral hairs, in ♀ usually without; the other sternites (on the two sides together): in ♂ III 5, IV 4, V 5, VI 6, VII 7; in ♀ III 4 to 6, IV 4 to 6, V 5 or 6, VI 6, VII 7 to 9, usually 8. Lower and median antepygidial bristles of ♀ long, median the longer, upper one much shorter.

Hindfemur with 2 subapical ventral bristles on outside and with or without a lateral one in basal fourth, on inside 1 subapical bristle, 1 lateral in basal fourth (occasionally 2 or 3 in ♀), ventrally 2 to 5 from subbasal notch to about $\frac{1}{3}$. Hindtibia on outside with a row of 13 to 15 lateral subdorsal bristles, on inside a row of 5 or 6; long postmedian dorsal bristle longer than its distance from apex of tibia, longest apical one $\frac{2}{3}$ the length of tarsal segment I. Longest apical bristle of hindtarsal segments I and II in ♂ extending beyond, in ♀ at most slightly beyond, the apex of the segment following, the longest of III not quite to apex

of IV ; at anterior margin of I about 7 to 10 notches, inclusive of apical one, the bristles in the proximal notches small, on posterior side 5 or 6 notches ; proportional lengths of segments : midtarsus, in ♂ 41, 27, 19, 11, 21, in ♀ 29 to 37, 20 to 25, 14 to 16, 9 to 11, 18 to 20 ; hindtarsus, in ♂ 67, 37, 25, 14, 23, in ♀ 49 to 60, 28 to 34, 19 to 24, 11 to 14, 20 to 23.

Modified Segments.—♂. VIII. t. an equilateral triangle (text-fig. 39) with the apex rounded off, the base (= proximal margin) irregular, and the dorsal

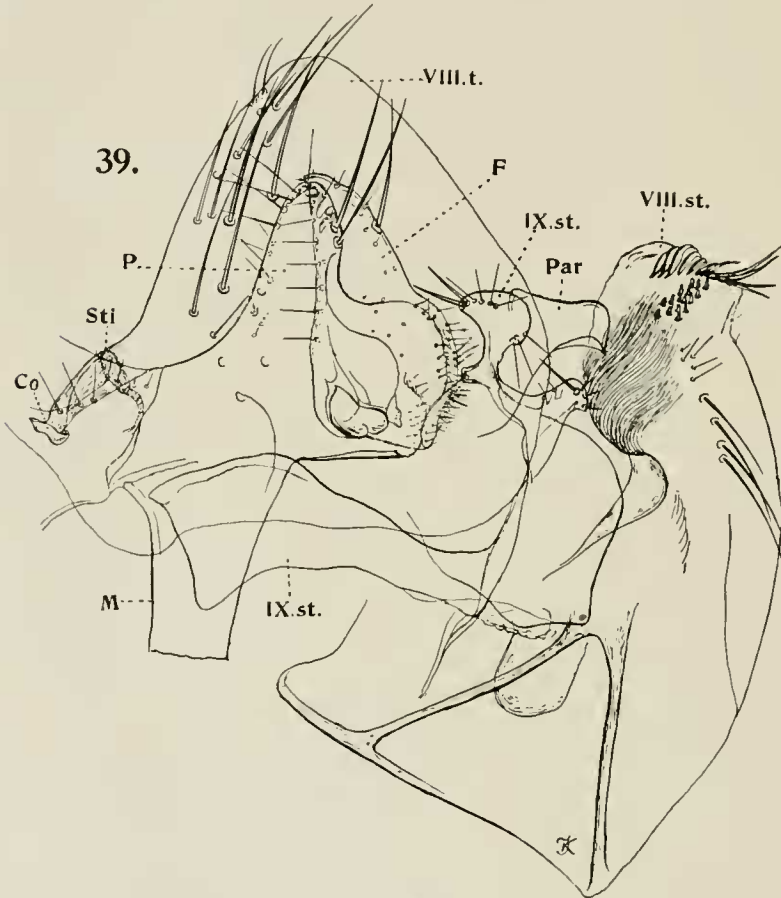


FIG. 39.—*Geusibia torosa* ♂.

and ventral margins somewhat rounded ; it bears about 15 long bristles on the side and 2 small marginal ones dorsally near apex, near stigma a few minute hairs. VIII. st. with a vertical proximal margin which is dorsally incrassate, ventral margin gently rounded, incurved close to apex, dorsal margin deeply incurved beyond middle, the lobe from this sinus to apical margin about one-third longer than broad, dorsally rounded and densely striate subtransversely, apical margin subtruncate, dorsally rounded, very feebly chitinised, bearing 5 spiniforms curved frontad and below them about 6 subspiniform bristles more or less directed ventrad, proximally of these peculiar spines a patch of about 15 very short obtuse conical spiniforms, at three-quarters of sides a horizontal row of 4 or 5 long

bristles, beyond which there is a patch of small hairs; the rod-like incrassations form an equilateral triangle with the proximal margin; the segment recalls that of the species of *Ctenophyllus*. Dorsal internal forward projection of IX. t. short; manubrium (M) of elasper measured ventrally one-fourth longer than its distance from apex of VIII. t.; about lower two-thirds of clasper strongly rounded-dilated ventrad (i.e. at a nearly right angle to M) and here bearing at and near the margin many minute hairs; a little more than upper third of clasper represented by a conical process P, which is a little broader than long and bears halfway to apex the two acetabular bristles, apex of process P rounded, at its frontal (= dorsal) side a row of about 10 bristles, some of which are quite small. Frontal side of exopodite F straight, with a regular row of small bristles (7 or 8), posterior margin somewhat rounded in upper half, incurved in middle, but less deeply than P, and excurved and hairy in lower half, the widened hairy portions of P and F feebly ehitinized, at posterior margin of F below apical fourth a long bristle. Apex of vertical arm of IX. st. broader than process P is long on posterior side; ventral arm with a postmedian ventral process similar to the head of a bird, and also similar to the paramere (Par), but only half the size; the process bears several small hairs and one bristle; apical portion of apical process irregularly ovate, with 3 thin ventral bristles and a row of 6 from upper angle nearly parallel with apical margin, the 2 at upper angle stronger, dorsal margin proximally to these bristles incurved, this sinus proximally bounded by a short truncate projection which bears a thin bristle. X. t. well separated from pygidium by a pale membrane, two and one-half times as long as broad, gradually narrowed from basal fourth to apex, X. st. triangular, upper proximal angle produced frontad, lower strongly rounded, on a level with base of X. t. the sternite more than one-half broader than the tergite, dorsal margin with a row of bristles from beyond middle to apex, 2 long bristles at apex. —♀. VII. st. with sinus (text-fig. 40), the lobe above the sinus narrow, usually pointed, shorter than the lower lobe, which is very broad, rounded or rounded-truncate. On VIII. t. above stigma 4 to 7 small bristles, below stigma 3 large ones close together, rarely 2, on lower surface 11 to 15, usually 11 or 12, on inside 3, less often 2. X. t. dorsally above base of stylet somewhat concave; spinose margin of X. st. incurved below middle, with 1 or 2 stout spiniform bristles at the proximal angle. Head of spermatheca not sharply divided from tail, widest towards orifice, rounded dorsally, about one-half longer than broad, tail narrowed

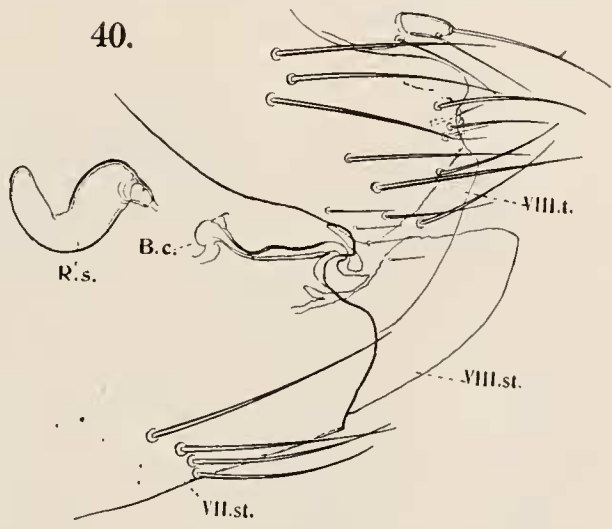


FIG. 40.—*Geusibia torosa* ♀.

at apex, without appendage, orifice on a strongly projecting, more or less conical, prominence; in one of the specimens the spermatheca is much shorter than in the others.

Length: ♂ 3.3 mm., hindfemur 0.59 mm.; ♀ 2.8 to 3.3 mm., hindfemur 0.52 to 0.56 mm.

Szechuan: Wu-chi, 13. and 22.v., on *Ochotona cansa*, 1 ♂, 8 ♀♀.

7. *Neopsylla stevensi* Roths. 1915 (text-fig. 41).

Szechuan: Mu-li, 29. and 31.iii., on *Rattus griseipectus*, 1 ♂, on *Antelionomys custos*, 1 ♀; I-tze, 23.iv., on *A. custos*, 1 ♀.

Described from a single ♂ collected by H. Stevens at the Nepal-Sikkim

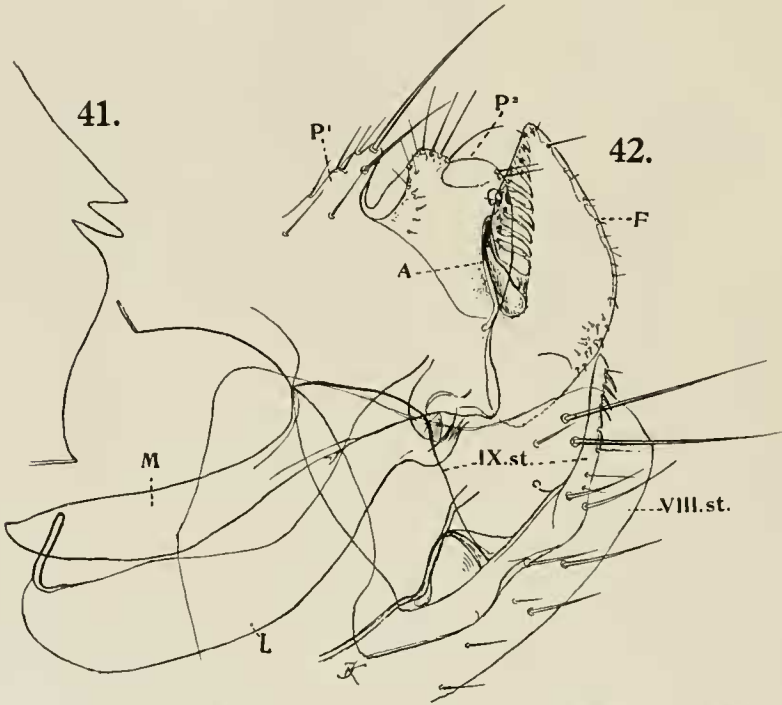


FIG. 41.—*Neopsylla stevensi* ♀.

FIG. 42.—*Neopsylla specialis* ♂.

frontier; the present ♂ agrees very well with the type. The ♀ has a peculiar VII. st., the upper angle of this segment being divided into two small lobes as shown in text-fig. 41. Duct of the bursa copulatrix long.

8. *Neopsylla specialis* sp. nov. (text-fig. 42).

♂. Near *N. stevensi* Roths. 1915, but the tail-end very different: Mannbrum (M) of clasper very much broader than in that species, widest in middle. Pale marginal area of frontal side of P² narrow; P² divided apically by a pale rounded space, on the frontal side of this space 4 apical marginal bristles, and from anterior apical angle of P² down several small ones, at posterior angle, which is rounded off, 2 or 3 smallish bristles. Exopodite F much broader than in *N. stevensi*, about two and one-half times as long as broad, its posterior margin

almost evenly rounded from base to apex; acetabulum (A) extending much farther dorsad than in *N. stevensi*. Vertical arm of IX. st. broad, posteriorly straight in lower two-thirds; horizontal arm narrowing to a sharp point, the apical third being very narrow, at apex a ventral row of 6 spiniforms, the one nearest apex very thin, farther frontad a few thin hairs. VIII. st. with about a dozen bristles, of which the two subapical ones are the longest. Penis-lamina at frontal end with a very prominent rod-like projection directed upwards or bent anad.

Yunnan: Nguluko, 6.ii., and Yung-ning, 19.iii., on *Apodemus agrarius*, 2 ♂♂.

9. *Neopsylla honora* (text-fig. 43).

♂. Likewise near *N. stevensi*. VIII. st. membranous at apex, the outline of which is uncertain; 4 long subapical bristles and farther frontad about a

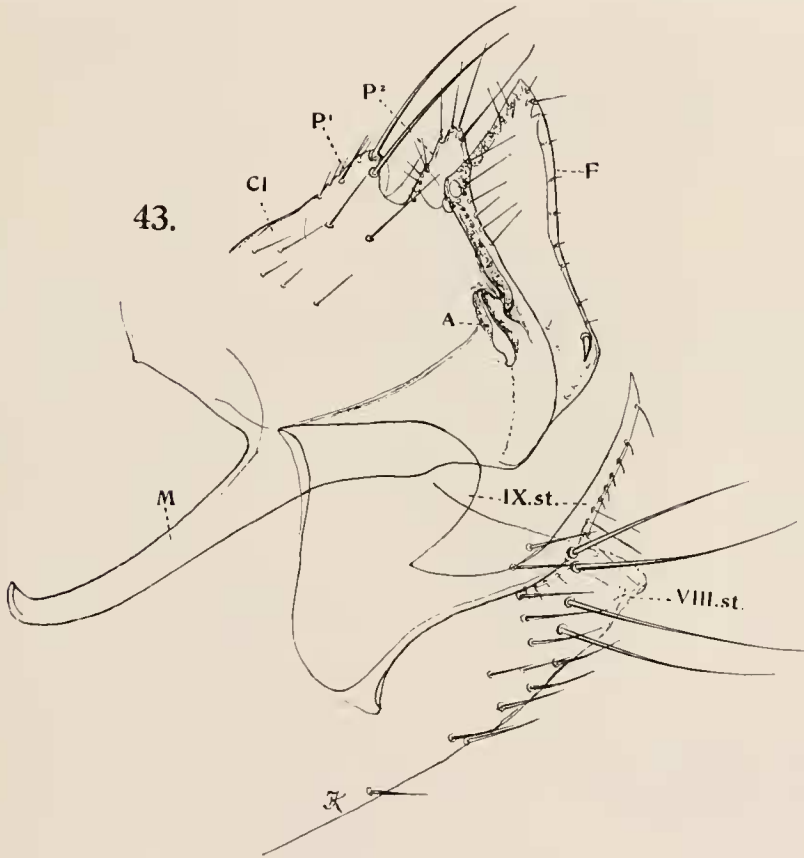


FIG. 43.—*Neopsylla honora* ♂.

dozen shorter ones. Manubrium (M) of clasper of nearly even width, broader than in *N. stevensi*, turned up at tip. Angle between M and IX. t. about 90°, with the tip rounded off. Process P¹ of clasper shorter than in *N. stevensi* and the preceding new species; process P² much narrower than in these species, on anterior side a row of short bristles and at posterior margin a row of 6 somewhat

longer ones. Exopodite F quite different from that of the near allies: posterior margin gradually incurved in middle, more strongly convex at basal third than towards apex, above the point of greatest ventral convexity a short stout pointed spiniform; anterior margin from upper end of acetabulum A to upper anterior angle as long as the oblique apical margin, the acetabulum extending not nearly so far dorsad as in *N. specialis* sp. nov. Vertical arm of IX. st. very broad, its apex anteriorly with a projecting sharp angle, posteriorly very strongly rounded-dilated, the posterior margin meeting the dorsal margin of the ventral arm at an acute angle; ventral arm slender, narrowed to a point, spiniforms replaced by short thin bristles, the one nearest the apex separated from the others by a larger interspace, the row continued frontad by longer thin bristles.

Yunnan: Nguluko, 2.ii., on *Eothenomys proditor*, 1 ♂.

10. *Ctenophthalmus parvus* sp. nov. (text-figs. 44, 45).

♂♀. Stigma of abdominal tergite VIII small. Clasper of the same general build as in *Ct. caucasica* Taschenb. 1880, *Ct. nivalis* Roths. 1909 and a host of others. Proboscis with curved hair at end. No lateral bristles in front of the two rows on meso-metanota; two rows on abdominal tergites, the anterior row very incomplete on the posterior segments.

Frons strongly rounded, tubercle a little below middle (the frons measured in a straight line), more ventral in ♀ than in ♂; the usual bristles on frons and occiput, the subapical row of the latter on each side with 5 bristles, a large gap between long ventral one and the next. Proboscis reaching to $\frac{4}{5}$ of coxa.

Pronotum with a comb of 18 to 20 spines, usually 18, which are at least as long as pronotum,

usually noticeably longer; a row of 12 bristles; on meso-metanota likewise 12, anterior row 12, in front of it some dorsal bristles on mesonotum; 2 or 3 false spines each side on mesonotum.

Abdominal tergites with 2 rows of bristles, no additional bristles, in ♂ on I and VII a row of 10, in ♀ usually 8, on the other tergites 12, less often 13, in front of this row in ♂ on II about 9, on III 5, on VII usually 2, in ♀ the numbers slightly larger; on sternites II to VIII of ♂ a row of 6, occasionally on one or the other segment 5, before this row 2, on VIII about 6 (on the two sides together), in ♀ the row contains 10, sometimes 11 bristles, before the row the greatest number on VI, namely 5 or 6, on VII only 2 to 4 such additional small bristles.

Hindtibia with 7 dorsal notches, third and sixth with one stout bristle, often

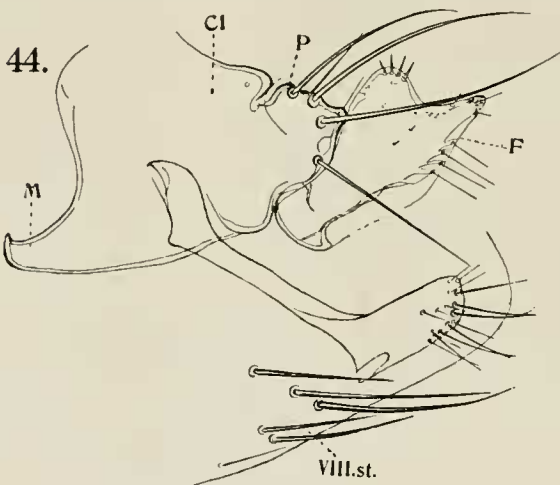


FIG. 44.—*Ctenophthalmus parvus* ♂.

accompanied by a minute one; long postmedian bristle about as long as first tarsal segment, which is $\frac{3}{4}$ the length of the tibia.

Modified Segments.—♂. Process P of clasper short and broad, with 4 or 5 long bristles, 3 or 4 of them dorsal, 1 thinner ventral, apical margin produced into a very short truncate cone, which bears a minute bristle and is partly covered by the lower dorsal bristle. Exopodite F broadest at apex, posterior margin convex above middle, above this swelling a submarginal row of 4 or 5 thin bristles, apical margin incurved, the sinus dividing the apex into two projections, posterior projection conical, higher than the anterior one, which is evenly rounded and bears some small pale spiniform bristles, usually 4. Ventral arm of IX. st. about two and one-half times as long as broad, apex gradually rounded from upper angle ventrad, with about 15 pale thin bristles.—♀. VII. st. twice incurved, the sinus shallow, the lobes short, upper one as a rule broader than submedian one, lower sinus oblique, the extent of variability illustrated by text-fig. 45, a, b, c; the marginal area incrassate as indicated in the figures, with a small frontad projection of the incrassation above lower lobe. Stylet elongate-conical, slender, a little more than thrice as long as broad.

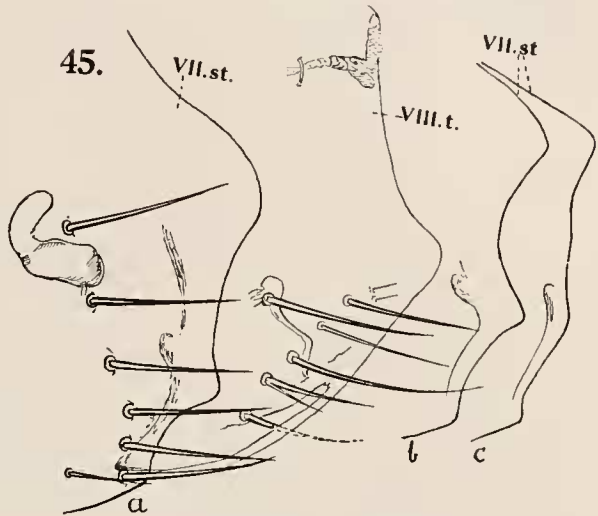


FIG. 45.—*Ctenophthalmus parvus* ♀.

Length: ♂ 2.0 to 2.2 mm., ♀ 2.0 to 2.4 mm.; hindfemur: ♂ 0.30 to 0.33 mm., ♀ 0.31 to 0.35 mm.

Szechuan: Wu-chi, 15., 16., 18.v., on *Antelionys custos*, 4 ♂♂, 5 ♀♀.

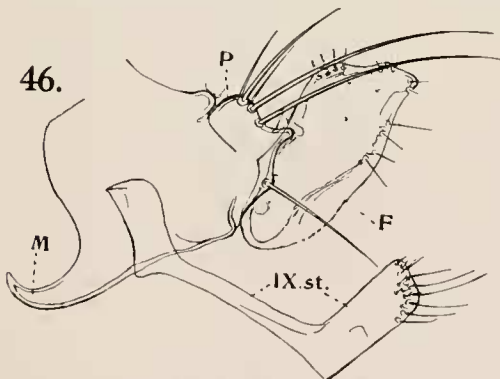


FIG. 46.—*Ctenophthalmus yunnanus* ♂.

11. *Ctenophthalmus yunnanus* sp. nov. (text-fig. 46).

♂. Chaetotaxy as in the previous species, to which the present one is closely related; abdominal tergites VI and VII without bristles in front of the row. Manubrium of clasper (M) narrower, more evenly curved. Process P differs in being dorsally strongly rounded, the projection of the posterior side much longer and the posterior dorsal bristle placed above the projection. Exopodite F slightly widened from base to apex, apically less wide than in the

previous new species, apical margin but slightly incurved, the anterior rounded apical portion not projecting upwards, the posterior angle slightly projecting posticad, not dorsad. Apex of vertical arm of IX. st. subtruncate, its posterior margin strongly rounded, but much less slanting than in *Ct. parvus* sp. nov.; ventral arm more truncate.

Yunnan: Nguluko, 6.ii., on *Apodemus agrarius*, 1 ♂.

12. *Ctenophthalmus dinormus* sp. nov. (text-fig. 47).

♀. Chaetotaxy as in the ♀ of *Ct. parvus* sp. nov. Margin of VII. st. twice incurved as in that species, but the bays deeper, the lobes therefore longer, the internal incrassation quite different, its frontal margin well defined and nearly parallel with the margin of the segment, below the upper lobe the incrassation forms a narrow, gently curved, posteriorly pointed ridge which inclines downwards posteriorly. Stigma of VIII. t. larger than in *Ct. parvus* and the stylet shorter (cf. text-fig. 47, *a dinormus*, *b parvus*).

Szechuan: I-tze Camp, Ku-lu, 23.iv., on *Antelionys custos*, 1 ♀.

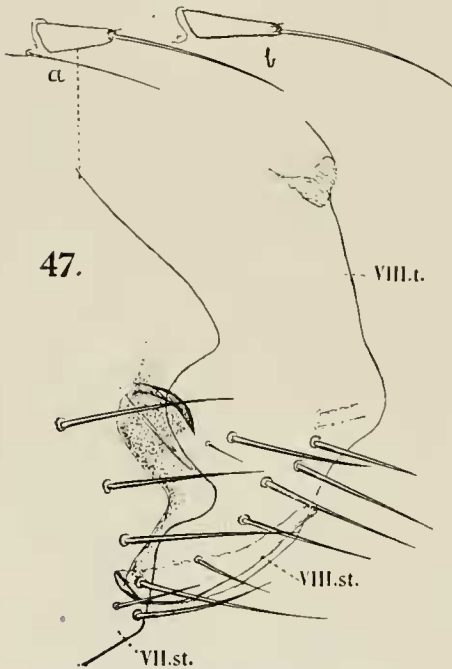


FIG. 47.—*Ctenophthalmus dinormus* ♀; (*a*) *Ct. dinormus*, stylet; (*b*) *Ct. parvus*, stylet.

Stenischia gen. nov.

♀. Near *Rhadinopsylla* J. & R. 1912. Spines of genal comb all on genal margin, none at margin of antennal groove; no eye-spine, a narrow short sulcus below margin of antennal groove as vestige of an eye. Episternum of metathorax fused with metanotum; both meso- and metasternum with narrow ventral projection (lateral aspect!). Dorsal margins of abdominal tergites and ventral margins of sternites (text-fig.

48) strongly chitinized from base to the row of long bristles. VII. t. between the two groups of 3 antepygial bristles with a process bearing 2 spines. Coxae reduced in width, especially hindcoxa, which is twice as long as it is wide at the broadest point, its hindmargin with prominent tooth below basal third, incurved from this tooth to apical lobe. Femora likewise reduced in width.— Genotype: *Stenischia mirabilis* sp. nov.

13. *Stenischia mirabilis* sp. nov. (text-figs. 48, 49).

♀. Frons with strong tubercle below middle, from the tubercle downward flattened, from base of antennal groove to oral corner a row of 6 smallish bristles, 2 eye-bristles, with a small bristle in between; area between comb and margin of frons long, distance from oral angle to base of ventral spine of comb longer than the distance between the oral margin and the antennal groove. Comb of 5

spines, the upper one quite small, placed at genal angle, there being but an indication of a genal process below this spine, ventral spine about as long as segment III of maxillary palpus, second and third a little broader, second a trifle longer than first, fourth the same in width, but distinctly shorter, a little over twice as long as broad. On occiput 3 rows of bristles, as f. i. in *Rhadinopsylla pentacanthus* Roths. 1897. Proboscis reaching somewhat beyond apex of coxa, with a curved apical hair and segment V the shortest (as in *Rhadinopsylla*).

48.

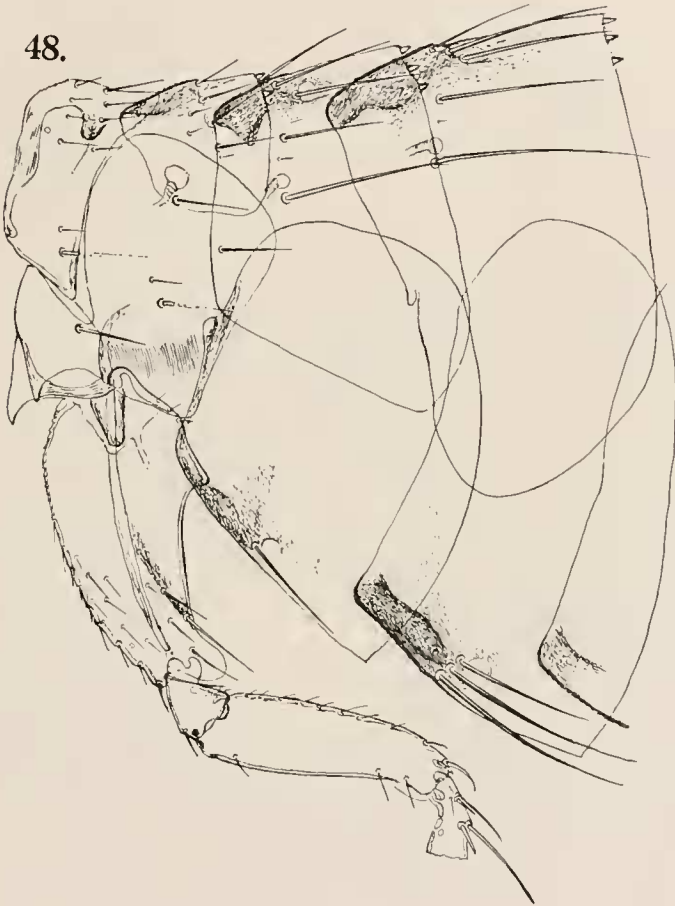


FIG. 48.—*Stenischia mirabilis* ♀.

Pronotum with a comb of 16 spines and a row of 10 bristles, which are smallish, as on meso- and metanotum and as the longest bristle of the subapical row of occiput. Mesopleura with 3 bristles; internal rod ending dorsally at anterior angle. Mesonotum incrassate at anterior and dorsal margins, the incrassation extending downwards in front of the posterior bristles. Metepisternum (text-fig. 48) large, extending farther dorsad than in the allied genera, with 4 bristles; stigma-cavity rounded, as are those on abdomen; a patch of very minute striation as in *Rhadinopsylla* (and a few allied genera). No apical spine on metanotum.

Incrassation of abdominal tergite I and sternite II less solid than in the other segments; on tergite II the incrassation triangular (lateral aspect), short, on III to VII longer, more or less strongly widened halfway between base and row of bristles; the row dorsally oblique, and here behind it a rounded transparent spot, a similar spot on the sternites behind the bristles; apical spines (on the two sides together) on I 5, II 6, III 5, IV 4, V 6, VI 5, VII 2; nearly all the bristles long, no small one in front of the row, 4 or 5 bristles in the row, on VI

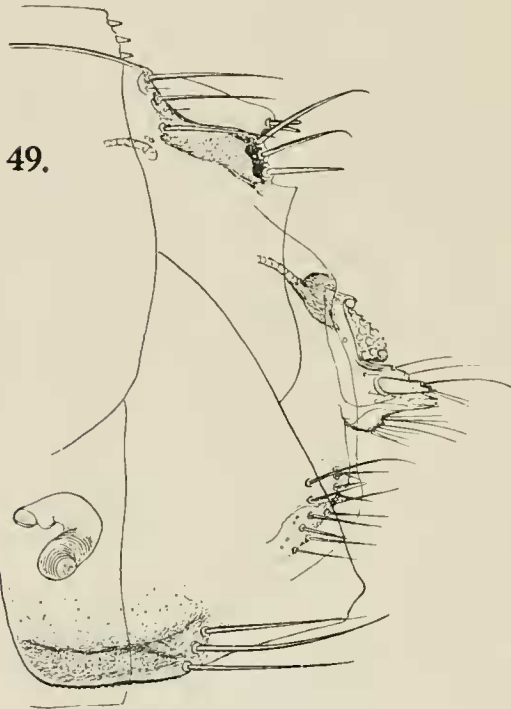


FIG. 49.—*Stenischia mirabilis* ♀.

and VII 3 or 4, on II to V one bristle below stigma, the stigma in the row; on sternites III to VI 6 bristles (two sides together), VII 7.

Forecoxa nearly thrice and mid- and hindcoxa more than twice as long as broad; anterior selerite (coxite) of midcoxa posteriorly near apex projecting as a tooth; in apical half of inner surface of hindcoxa about a dozen short bristles. Mid- and hindfemur almost straight above, about four times as long as broad in middle; hindfemur on outside with a subventral bristle behind subbasal notch and 2 near apex; on inside one subapical bristle. All tibiae with 6 dorsal notches, which are deep on hindtibia; the latter with 6 subdorsal lateral bristles on outside; longest

dorsal apical bristle of hindtibia reaching to subapical notch of tarsal segment I, longest of hindtarsal I beyond subapical notch of II, longest of II to basal third of IV, V in all tarsi with 4 pairs of plantar bristles; measurements: midtarsus 12, 12, 8, $6\frac{1}{2}$, 15; hindtarsus 30, 20, 11, 7, $16\frac{1}{2}$.

Modified Segments.—♀. VII. st. triangular (text-fig. 49), posterior margin slanting to near ventral angle, which is obliquely truncate-emarginate. VII. t. with sharp angle below antepygial bristles; the median dorsal portion of VII. t. pale, the two apical spines much longer than the spines of the other tergites. Upper antepygial bristle longer than the others, the lowest one slightly the stoutest. On VIII. t. no bristles above and below the large stigma; on ventro-apical area a patch of 9 bristles, nearly all shortish, on inside 3. Stylet nearly cylindrical, its long bristle not quite apical. Spermatheca of the *Rhadinopsylla* type, apex of tail concave on posterior side, below this groove a swelling.

Length: 2.5 mm., hindfemur: 0.28 mm.

Szechuan: Mu-li, 31.iii., on *Antelionys custos*, 1 ♀.